

Do Radiologists Have Stage Fright? Tumor Staging and How We Can Add Value to the Care of Patients with Cancer¹

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Imaging is frequently the initial tool used for cancer staging, although the role of imaging in staging varies according to tumor site. Radiologists and nuclear medicine physicians have an important role not only in detecting malignancy, assessing response to therapy, and evaluating for disease recurrence, but also in determining appropriate therapy decisions by providing cancer staging.

The American Joint Committee on Cancer (AJCC) and the Union for International Cancer Control (UICC) publish a cancer staging manual that reflects the current medical understanding of the biologic behavior of tumors and available treatment options (1,2). The current edition of the *AJCC Cancer Staging Manual* is the 7th Edition, and work is underway for the 8th Edition. Radiologists and nuclear medicine physicians (“imagers”) are included in the Editorial Board for the 8th Edition and in each Expert Panel for tumors where imaging is relevant to staging. Thus, imaging will be an increasingly important aspect of the staging rules in the 8th Edition, and, in some sections, discussion of imaging will be more detailed than in previous editions.

Staging is currently an anatomically based description of the patient's tumor burden: the location and extent of the primary tumor and any evidence of nodal disease and of distant (metastatic) spread. In the AJCC-UICC manuals, these tumor descriptors are designated as the T, the N, and the M, respectively. Oncologists determine a final clinical stage (“cTNM”) by combining all available information (physical examination findings, imaging findings, and histopathologic findings from fine-needle aspiration and sentinel node biopsy, etc). The clinical “c” is replaced with the prefix “p” when pathologic information from surgical tumor resection is included. The cTNM and pTNM

determine each patient's overall anatomic stage or prognostic group (0–IV), which in turn influences the choice of treatment plans and enables effective communication between care teams. The staging system also permits an accurate way to compare the efficacy of new treatment paradigms with those in historical cohorts and to establish entry criteria for new prospective clinical trials.

So why should radiologists include staging information in their reports? The most obvious response to such a question is that this is frequently the specific indication on the imaging requisition form: “Lung cancer, staging scan,” “Staging larynx cancer,” or “Non-Hodgkin lymphoma—staging PET.” The patient is referred to us for our opinion on their cancer stage. How can we possibly choose not to answer this question? When radiologists and nuclear medicine physicians do not report staging information, it forces oncologists (and cancer registries) to reinterpret imaging reports that may be intentionally or unintentionally ambiguous.

Omission of information from the imaging report is a potential cause for incomplete staging. Important data may be unintentionally omitted by imagers when they do not recognize the importance of findings for cancer staging or sometimes may be intentionally omitted when there is uncertainty about interpreting a finding as present or absent. The former situation of unintentional omission can be ameliorated with structured reporting that reflects the AJCC-UICC staging tables. This permits imagers to follow a “checklist” approach and ensures that critical staging findings are evaluated as present, absent, or indeterminate and does not require the radiologist to remember the subtle differentiating points of the staging system.

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Some components required for staging in certain tumor types come from physical or pathologic examination—eg, vocal cord fixation for laryngeal carcinoma (T3) and Gleason stage for prostate cancer staging. Because this information cannot be determined with imaging alone, a supplemental sentence in the impression section of the structured report should acknowledge that the cTNM or pTNM stage will be determined by the oncologist with the relevant, nonimaging additional information. Absence of a nonimaging component of the staging should not dissuade the imager from otherwise reporting the N and M stage information and any imaging features that might supersede the examination findings (eg, penetration of laryngeal carcinoma through the cartilage, stage T4a). We must try to answer the specific questions that separate T4 from T3 and T2 tumors and N1 from N0 disease, and we must move away from the noncommittal report and from “hedging” on our reports, which can lead to misinterpretations.

When asked why they choose not to stage cancer, subspecialist radiologists sometimes respond, “It’s not my job.” Because the cTNM stage for some tumors is almost entirely based on imaging findings, this answer has very little foundation. In this value-based era of medicine, radiologists and nuclear medicine physicians need to understand that this *is* their job. Perhaps for some imagers, “stage fright” reflects a lack of familiarity with the staging tables and with what oncologists and surgeons want to know. This presents for us an opportunity to enhance our continuing medical educational offerings, including journal review articles and educational lectures on key staging issues and to openly share structured staging reports based on AJCC-UICC tables.

Another reason given for not providing full staging information relates to uncertainty as to the validity of an

observation—for example, “How do I know if a lymph node is truly involved or not, if it is enlarged?” Imaging is influenced by perception and sometimes by the quality of imaging data. No imaging modality provides 100% accuracy for staging. For example, in head and neck cancers, cartilaginous involvement by tumor, nodal metastatic disease, and extranodal extension of tumor are just three challenging imaging diagnoses for which we may search, yet even when we use a multimodality approach, uncertainty exists.

As a professional community, we must strive to determine or develop the most accurate imaging methods for tumor characterization, and in the meantime we must all do our best to address staging with the imaging tools we have. Our purpose as imagers is to interpret the studies as best we can, even when we feel uncomfortable with evaluating subtle disease manifestations. This is the art of image interpretation and also the value of the imager. For head and neck cancer, reporting an “indeterminate lymph node” is better than omitting mention of a potentially abnormal node. In many cases, an additional test such as fine-needle aspiration may resolve this question; in some situations, indeterminate findings allow a surgeon to prepare a patient for the fact that surgical plans might change depending on the intraoperative findings. In certain situations, an equivocal finding may not change treatment, because a potentially positive node may be resected or radiated as part of routine therapy for that stage or type of tumor. Being familiar with the treatment plans of your oncologists and surgeons—for example, as published in National Comprehensive Cancer Network guidelines or as discussed in tumor boards or directly with referring clinicians—will make radiologists much more comfortable with indeterminate findings (3). We need to educate ourselves, our trainees, and

each other about the detailed process of cancer staging and management.

Evidence-based anatomic staging systems such as the AJCC-UICC system continue to be the critical factor in determining patient treatment plans. With current shifts in our health care system and a growing national discussion around the concept of the value of imaging, it is time for radiologists and nuclear medicine physicians to recognize and accept our role in the multidisciplinary oncology team. Our surgeons, our medical and radiation oncologists, and our patients need us to step out of the wings and onto the stage. It is time to overcome our discomfort with cancer staging.

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References

1. Edge S, Byrd DR, Compton CC, Fritz AG, Greene FL, Trotti A, eds. AJCC cancer staging manual. 7th ed. New York, NY: Springer-Verlag, 2010.
2. Sobin LH, Gospodarowicz MK, Wittekind C, eds. TNM classification of malignant tumours. 7th ed. Chichester, England: Wiley-Blackwell, 2009.
3. National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®). http://www.nccn.org/professionals/physician_gls/f_guidelines.asp. Accessed July 12, 2015.